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NONLINEAR INELASTIC MODEL OF STEEL COLUMN WITH SEMI-RIGID FRAME CONNECTIONS

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Abstract

Formulation of a nonlinear inelastic model of steel column with semi-rigid frame connections is outlined in this paper. Mechanical based equations were incorporated into the formulation of the model. Steel stress-strain curve with strain hardening was adopted as the material model. A pair of translation springs in vertical and lateral directions and a rotational spring was attached to each end of the column to represent a semi-rigid connection. Results obtained from the proposed model were compared with the corresponding results from finite element analysis. Good agreement was shown between the proposed model and the numerical results. It is evident from the results that the proposed model could be used to analyse the behaviour of a steel column in a semi-rigid frame.

Keywords: Elastic restraint, Nonlinear inelastic analysis, Semi-rigid connections, Steel column, Steel frame.